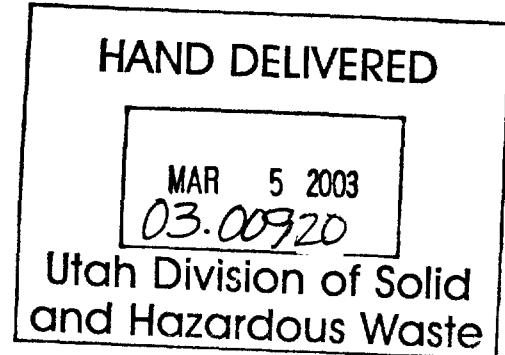


March 4, 2003

Mr. Phil Burns
 Department of Environmental Quality
 Division of Solid and Hazardous Waste
 288 North 1460 West
 Salt Lake City, UT 84114-4880



RE: Solitude Class 1 Landfill
 Response to Request for Additional Information

Dear Phil:

Following is our response to your letter of January 2, 2003 requesting additional information regarding the permit application for the Solitude Landfill. The information presented here is provided in the same order as in your letter. In the event that you would like a full copy of the revised application, or a redlined version of the text with appendices, please let me know and I'll provide it to you.

1. **Topographic Map.** Please find two copies of the topographic map (Figure 1) attached.
2. **Blasting and Fracturing of Shale.** No blasting will be required to excavate the landfill cells. The site engineer has indicated that the area will be ripped using a crawler-dozer, followed by excavation and removal of the ripped soils.
3. **Browns Wash Drainage.** The drainage area of Brown's Wash located upgradient from the Solitude Landfill site encompasses 27,930 acres (see attached map). The estimated flow in Brown's Wash originating from a 100-year storm event was calculated using the TR-20 SCS method. The attached sheets present the assumptions, input parameters, resulting hydrograph, and conclusions. Based on the input parameters used, the estimated peak flow from this storm event is 1020 cfs.

The calculated depth of flow of 3.46 ft will remain within the confines of the channel, which is approximately 5 ft deep. The peak velocity of 8.3 fps necessitates that some rip rap be placed on the banks of the channel, near the northeast corner of Cell 1, extending approximately 30 to 50 feet on either side of the point of closest approach of the channel to the site boundary. The rip rap will serve to protect the corner of Cell 1 from undercutting. No other effects are anticipated from runoff in Browns Wash.

There is no runoff from open cells. All runoff in contact with waste is maintained within the open cell (see Figure 8 of the Permit Application). During construction and waste filling of the above-grade portion of the cells, a berm will be maintained around the perimeter of the open portion of the cell to prevent runoff.

4. **Threatened or Endangered Species.** This information is provided as a letter from the Utah Division of Wildlife Resources, attached. This letter can be included in Appendix F "Supporting Documentation".
5. **Slopes and Slope Stability.** The information provided on page 24, Section 6.2 is correct. The final cover will have a slope of 4:1. The information provided on Drawing 7 is also correct. The berms are 3:1 maximum slope; however, Drawing 7 does not show the final cover to be at a 3:1 slope. Drawing 7, Section E shows the final cover at 4:1, which is correct. Drawing 7, Section C shows the final cover at "3% - 5%" which should have been specific only to the crown of the final cover.

More simply put, the berm will be constructed at a slope of 3:1 maximum, the final cover will be constructed to a slope of 4:1, and the crown of the final cover will be constructed to a slope of 3% to 5%. Only Drawing 7, Section C is in error, not stating that the cover will be constructed at 4:1 below the crown.

We neglected to include the Slope Stability calculations in the previous application submittal. This information was originally included as a separate appendix in the 1994 application to DWQ. I have included that information here as an attachment.

Information on the structural integrity, shear strength, compaction, and potential swell of the shale materials was included in the permit application, Appendix D "Field and Laboratory Programs – 1984", part 4 "Geotechnical Laboratory Test Results".

6. **Landfill Capacity.** The capacity information may well have been confusing. The total capacity of the landfill is 22 million cubic yards (Mcy). The total waste capacity (i.e. total capacity less daily cover materials) is 19.8 Mcy. Cell capacities are:

Cell 1 = 5 Mcy
Cell 2 = 11 Mcy
Cell 3 = 6 Mcy

The capacity stated as 17 Mcy on page 20 was for calculation of the life of Cells 2 and 3. The capacity stated as 17 Mcy of waste on page 24 was in error; the total waste capacity of the landfill (all three cells) is 19.8 Mcy.

7. **Financial Assurance and Post-Closure Cost Tables.** The revised Section Eight Financial Assurance is attached with this letter. The section includes language that a stand-by trust fund will be established if bonds that do not allow partial-payments are used. Tables 4 and 5 have been expanded to Tables 4, 5, and 6 to allow separation of closure costs from post-closure costs.

Sincerely,

Michael C. O'Hara
Solid Waste Operations Manager

Darin Worden
Branch Manager

SECTION EIGHT FINANCIAL ASSURANCE

8.0 FINANCIAL ASSURANCE

An estimate for the closure and post-closure care of the Solitude landfill is summarized in Tables 4, 5, 6 and 7. The estimate is based on the total area for final closure of 2 acres, and an entire cell area of 71 acres each for Cells 1 and 3, and 120 acres for Cell 2. All soil will come from on-site. These tables reflect the maximum area requiring closure at any one time, and has been compiled from information developed by the Oklahoma Department of Environmental Quality for estimating closure and post-closure care costs (see Section Nine)

**Table 4
Summary of Estimated Closure Costs for Cell 1, 2, or 3**

| Task / Service | Quantity | Units | Unit Cost | Task Cost |
|------------------------------------|----------|-----------|-----------|-----------------|
| Conduct Site Evaluation | 1 | Lump Sum | \$2,750 | \$2,750 |
| Remove Buildings & Equipment | 1 | Lump Sum | \$2,450 | \$2,450 |
| Final Grading | 2 | Acres | \$1,122 | \$2,244 |
| Move & Compact On-Site Clay | 4,840 | Cubic Yds | \$3.20 | \$15,488 |
| Move & Place Erosion Control Cover | 1,613 | Cubic Yds | \$12.00 | \$19,356 |
| Subtotal | | | | \$42,288 |
| Technical & Professional Services | 1 | Lump Sum | 7% | \$2,960 |
| Contingency | 1 | Lump Sum | 10% | \$4,229 |
| Total | | | | \$49,477 |

**Table 5
Summary of Estimated Post-Closure Costs for Cell 1 or 3**

| Task / Service | Quantity | Units | Unit Cost | Task Cost |
|---------------------------------------|----------|-----------|-----------|------------------|
| Post-Closure Inspections ¹ | 120 | Events | \$500 | \$60,000 |
| Methane Gas Monitoring ² | 120 | Events | \$140 | \$16,800 |
| Repair / Maintain Cover ³ | 4,260 | Cubic Yds | \$12 | \$51,120 |
| Subtotal | | | | \$127,920 |
| Technical & Professional Services | 1 | Lump Sum | 7% | \$8,954 |
| Contingency | 1 | Lump Sum | 10% | \$12,792 |
| Total | | | | \$149,666 |

**Table 6
Summary of Estimated Post-Closure Costs for Cell 2**

| Task / Service | Quantity | Units | Unit Cost | Task Cost |
|---------------------------------------|----------|-----------|-----------|------------------|
| Post-Closure Inspections ¹ | 120 | Events | \$500 | \$60,000 |
| Methane Gas Monitoring ² | 120 | Events | \$140 | \$16,800 |
| Repair / Maintain Cover ³ | 7,200 | Cubic Yds | \$12 | \$86,400 |
| Subtotal | | | | \$163,200 |
| Technical & Professional Services | 1 | Lump Sum | 7% | \$11,424 |
| Contingency | 1 | Lump Sum | 10% | \$16,320 |
| Total | | | | \$190,944 |

NOTES TO TABLES:

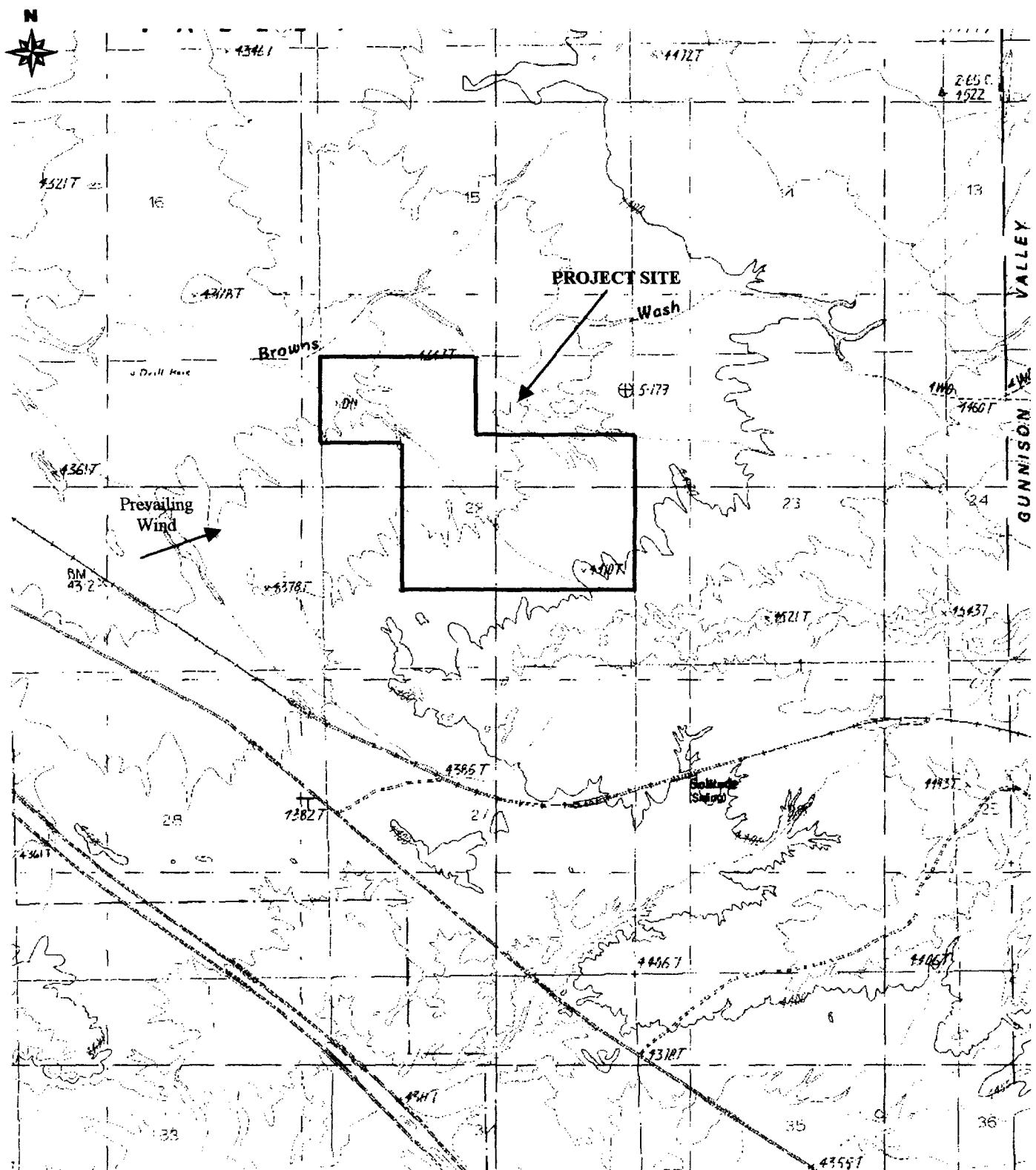
¹ May be reduced to annual inspections upon site stabilization, with DEQ approval

² May be discontinued upon site stabilization, with DEQ approval

³ Calculated at 2 cy/acre x 120 acres x 30 years

8.1 FINANCIAL ASSURANCE MECHANISM

The Owners propose to use a bond as the financial assurance mechanism. Each Cell will have its own bond as an individual funding mechanism. A stand-by trust fund will be established if bonds that do not allow partial-payments are used.

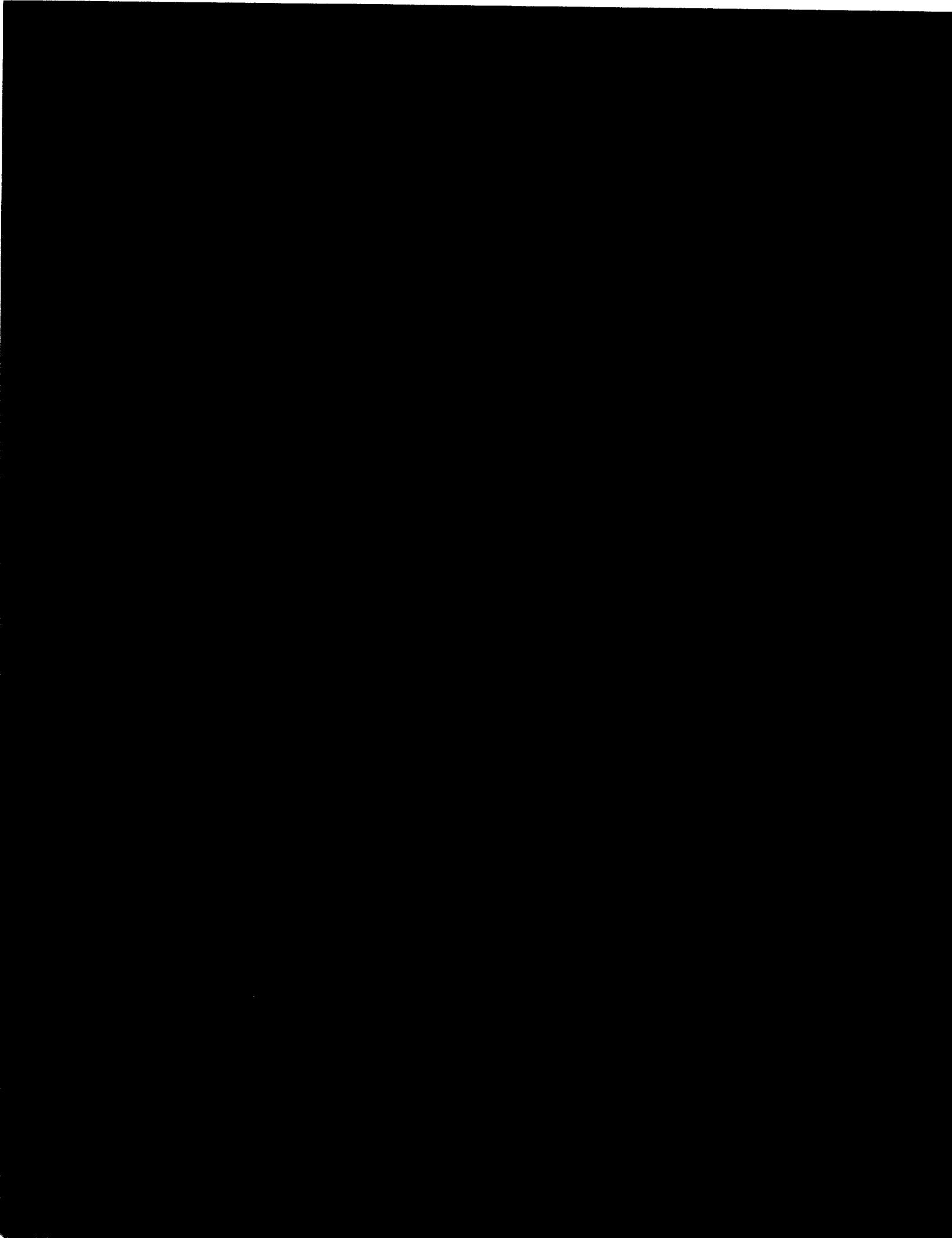


2681 Parleys Way, Suite 106
Salt Lake City, Utah 84109
(801) 412-0003

SCALE: 1:24,000
CONTOUR INTERVAL: 40 FEET

FIGURE 1

**Green River NE Quadrangle
Utah – Grand County
7.5 Minute Series (Topographic) Map**



SECTION SIX

SHALE SWELLING POTENTIAL

The embankments of the landfill cells are to be constructed with excavated Mancos Shale material. Laboratory testing was performed on shale samples from the Green River Landfill site to determine the swelling potential the shale and soil would exhibit when wetted. The procedure used is as follows:

- 1) Specimens of shale and weathered shale (soil) are placed in the consolidometer at natural moisture content, loaded in the normal manner to some preselected load, and allowed to come to equilibrium;
- 2) immerse the sample and observe the height increase until equilibrium is reached;
- 3) reduce the vertical pressure by a factor of two and observe the associated swell;
- 4) repeat step (3) until loading is removed;
- 5) plot the curve representing swelling pressure versus percent expansion.

The results of the testing are included on the graphs included in Attachment 3. The testing indicates that the largest swell observed was a 1.12% under a loading of 0.013 ksf (thousand pounds/square foot). Given a density of 110 pounds per cubic foot (pcf) for the shale at the site, this loading corresponds to a depth of 0.12 feet. A swell of 1.12% would be equivalent to 0.02 inches.

The results indicate that the shale and the weathered shale are very similar in their swelling potential. Weathering of the shale is not expected to have an adverse effect on the stability of the embankments.

Purpose: Calculate factor of safety for the outer surface of the waste cell embankment.

Assume:

Use PC-ESTABLISH to predict stability
Embankment material is excavated shale

- 4 cases: 1) Static case
2) Static with vehicle loading (top at mid-point of embankment)
3) Pseudo-static (earthquake)

Earthquake acceleration is less than 0.10g (use 0.10g for analysis)

* Use acceleration with 90% of not being exceeded in 250 years.

* S.T. Algermissen, et al.; 1982; "Probabilistic Estimates of Maximum Acceleration And Velocity In Rock In The Contiguous United States"; U.S.G.S Open File Report, 82-1033

Soil Parameters

Marcos Shale

Shale material is a blocky angular rockfill typically well graded with a maximum dimension of 18" and very little fines

Strength of the shale is determined from the following:

* Yang R.M., 1980, "Laboratory Shear Strength of Soil", An ASTM symposium in Chicago Ill., June 25, 1980, ASTM 740

* Winkler H.F., Fang H., 1975, "Foundation Engineering Handbook"

| | Rockfill (1) | In-Situ (2) |
|----------------|--------------|-------------|
| ϕ | 30° | 15° |
| C | 0 | 5000 psf |
| γ_d | 120 | 130 |
| γ_{sat} | 145 | 155 |

(1) From Winkler $\rightarrow \theta$ well graded shale = 35°
 θ poorly graded shale = 33°

From ASTM 740 $\rightarrow \theta = 36^\circ$ from Fig 6.
Conservatively assume $\theta = 30^\circ$

(2) From Winkler $\rightarrow C$ for unfavorable shale ranges 5-100 psi; (120-14,400 psf);
 C for favorable shale ranges 100 to >1000 psi;
 θ for unfavorable shale ranges 10-20°
 θ for favorable shale ranges 20-65°
Conservatively assume $\theta = 15^\circ$
 $C = 35$ psi (5000 psf)

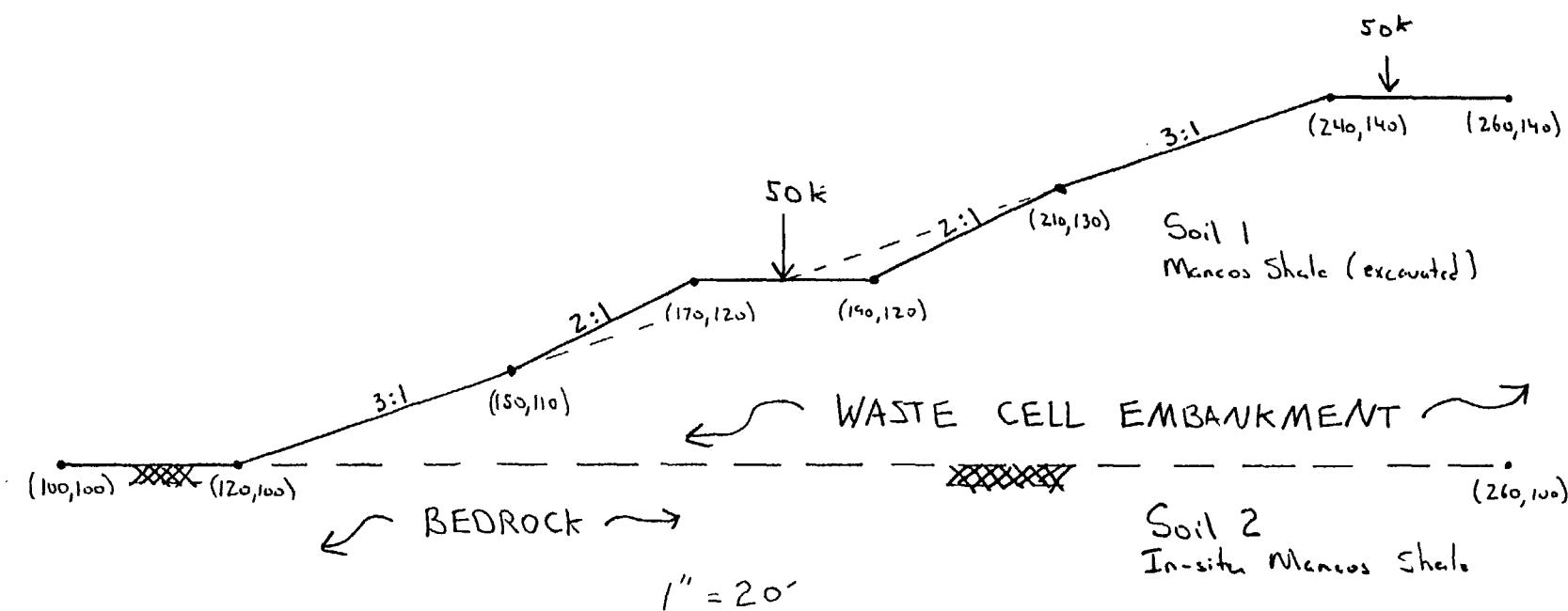
Assume: No phreatic surface

- Cases → 1) static (with applied vehicle load (50k))
 2) Pseudo-Static without applied vehicle load (earthquake)

Soil parameters given below →

Horizontal acceleration = $0.10g$

| | Soil 1 | Soil 2 |
|----------------|--------|----------|
| γ | 120 | 130 |
| γ_{sat} | 145 | 155 |
| C | 0 | 5000 psf |
| ϕ | 30° | 15° |



Results of STABL Runs

| | Factor of safety | Required |
|------------------------------|------------------|----------|
| Static | 1.8 | 1.5 |
| Static - load at top embank. | 1.5 | 1.5 |
| Static - load at mid-point | 1.9 | 1.5 |
| Pseudo-Static (E quake) | 1.3 | 1.0 |

Because calculated F.S. \geq Required, landfill is stable.

50 SHEETS
100 SHEETS
200 SHEETS

22-141
22-142
22-144

AMPAQ

**** PCSTABL5M ****

by
Purdue University

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

Run Date: 11/25/94
Time of Run: 16:20
Run By: DEW
Input Data Filename: RUN1NOL
Output Filename: RUN1NOL.OUT

PROBLEM DESCRIPTION:
ITEX Green River Landfill - Run1 (Static case with no vehicle loading)

BOUNDARY COORDINATES

7 Top Boundaries
8 Total Boundaries

| Boundary No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Soil Type Below Bnd |
|--------------|-------------|-------------|--------------|--------------|---------------------|
| 1 | 100.00 | 100.00 | 120.00 | 100.00 | 2 |
| 2 | 120.00 | 100.00 | 150.00 | 110.00 | 1 |
| 3 | 150.00 | 110.00 | 170.00 | 120.00 | 1 |
| 4 | 170.00 | 120.00 | 190.00 | 120.00 | 1 |
| 5 | 190.00 | 120.00 | 210.00 | 130.00 | 1 |
| 6 | 210.00 | 130.00 | 240.00 | 140.00 | 1 |
| 7 | 240.00 | 140.00 | 260.00 | 140.00 | 1 |
| 8 | 120.00 | 100.00 | 260.00 | 100.00 | 2 |

ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

| Soil Type | Total Wt. (pcf) | Saturated Wt. (pcf) | Cohesion (psf) | Friction Angle (deg) | Pore Pressure Param. | Pressure Constant (psf) | Piez. Surface No. |
|-----------|-----------------|---------------------|----------------|----------------------|----------------------|-------------------------|-------------------|
| No. | (pcf) | (pcf) | (psf) | (deg) | Param. | (psf) | No. |

| | | | | | | | |
|---|-------|-------|--------|------|-----|----|---|
| 1 | 120.0 | 145.0 | .0 | 30.0 | .00 | .0 | 1 |
| 2 | 130.0 | 155.0 | 5000.0 | 15.0 | .00 | .0 | 1 |

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

300 Trial Surfaces Have Been Generated.

**15 Surfaces Initiate From Each Of 20 Points Equally Spaced Along The Ground Surface Between $X = 105.00$ ft.
and $X = 164.00$ ft.**

**Each Surface Terminates Between $X = 240.00$ ft.
and $X = 260.00$ ft.**

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is $Y = 80.00$ ft.

10.00 ft. Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

*** * Safety Factors Are Calculated By The Modified Bishop Method * ***

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|-----------|----------------|----------------|
| 1 | 132.95 | 104.32 |
| 2 | 142.76 | 106.22 |
| 3 | 152.53 | 108.36 |
| 4 | 162.25 | 110.72 |
| 5 | 171.91 | 113.30 |
| 6 | 181.51 | 116.11 |
| 7 | 191.04 | 119.14 |
| 8 | 200.50 | 122.39 |
| 9 | 209.88 | 125.86 |
| 10 | 219.17 | 129.54 |
| 11 | 228.38 | 133.44 |
| 12 | 237.50 | 137.55 |
| 13 | 242.61 | 140.00 |

Circle Center At $X = 55.5$; $Y = 529.0$ and Radius, 431.7

***** 1.813 *****

Individual data on the 17 slices

| Slice No. | Width Ft(m) | Weight Lbs(kg) | Water | | Tie | | Earthquake | | Load Lbs(kg) |
|--------------|----------------|-------------------|------------------|------------------|------------------|------------------|----------------|----------------|-----------------|
| | | | Force Lbs(kg) | Force Lbs(kg) | Force Lbs(kg) | Force Lbs(kg) | Tan Lbs(kg) | Hor Lbs(kg) | |
| 1 | 9.8 | 803.4 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 2 | 7.2 | 1545.0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 3 | 2.5 | 775.7 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 4 | 9.7 | 4847.3 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 5 | 7.7 | 5864.2 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 6 | 1.9 | 1594.1 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 7 | 9.6 | 6094.1 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 8 | 8.5 | 2585.7 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 9 | 1.0 | 159.9 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 10 | 9.5 | 2402.1 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 11 | 9.4 | 3902.5 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 12 | .1 | 61.0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 13 | 9.2 | 4185.3 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 14 | 9.2 | 3425.2 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 15 | 9.1 | 2351.1 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 16 | 2.5 | 429.8 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| 17 | 2.6 | 195.2 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 120.53 | 100.18 |
| 2 | 130.39 | 101.82 |
| 3 | 140.21 | 103.69 |
| 4 | 149.99 | 105.78 |
| 5 | 159.72 | 108.11 |
| 6 | 169.39 | 110.65 |
| 7 | 179.00 | 113.43 |
| 8 | 188.54 | 116.42 |
| 9 | 198.01 | 119.64 |
| 10 | 207.40 | 123.07 |
| 11 | 216.71 | 126.72 |
| 12 | 225.93 | 130.58 |
| 13 | 235.06 | 134.66 |
| 14 | 244.10 | 138.95 |
| 15 | 246.18 | 140.00 |

Circle Center At X = 54.7 ; Y = 526.2 and Radius, 431.1

*** 1.816 ***

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 132.95 | 104.32 |
| 2 | 142.88 | 105.52 |
| 3 | 152.75 | 107.07 |
| 4 | 162.57 | 108.98 |
| 5 | 172.31 | 111.24 |
| 6 | 181.96 | 113.85 |
| 7 | 191.52 | 116.81 |
| 8 | 200.96 | 120.10 |
| 9 | 210.28 | 123.74 |
| 10 | 219.46 | 127.70 |
| 11 | 228.49 | 132.00 |
| 12 | 237.36 | 136.61 |
| 13 | 243.34 | 140.00 |

Circle Center At X = 104.6 ; Y = 381.0 and Radius, 278.2

*** 1.838 ***

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 120.53 | 100.18 |
| 2 | 130.37 | 101.94 |
| 3 | 140.18 | 103.88 |
| 4 | 149.95 | 106.01 |
| 5 | 159.68 | 108.33 |
| 6 | 169.36 | 110.83 |
| 7 | 178.99 | 113.51 |
| 8 | 188.57 | 116.38 |
| 9 | 198.10 | 119.42 |
| 10 | 207.56 | 122.65 |
| 11 | 216.97 | 126.05 |
| 12 | 226.30 | 129.64 |
| 13 | 235.57 | 133.39 |
| 14 | 244.77 | 137.33 |
| 15 | 250.70 | 140.00 |

Circle Center At X = 32.5 ; Y = 620.8 and Radius, 528.0

*** 1.850 ***

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 132.95 | 104.32 |
| 2 | 142.91 | 105.20 |
| 3 | 152.82 | 106.50 |
| 4 | 162.68 | 108.21 |
| 5 | 172.45 | 110.34 |
| 6 | 182.12 | 112.87 |
| 7 | 191.68 | 115.80 |
| 8 | 201.11 | 119.13 |
| 9 | 210.39 | 122.85 |
| 10 | 219.51 | 126.96 |
| 11 | 228.45 | 131.44 |
| 12 | 237.19 | 136.29 |
| 13 | 243.26 | 140.00 |

Circle Center At X = 116.8 ; Y = 343.0 and Radius, 239.2

*** 1.852 ***

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 123.63 | 101.21 |
| 2 | 133.62 | 101.72 |
| 3 | 143.58 | 102.65 |
| 4 | 153.48 | 104.00 |
| 5 | 163.33 | 105.77 |
| 6 | 173.08 | 107.95 |
| 7 | 182.74 | 110.55 |
| 8 | 192.28 | 113.55 |
| 9 | 201.68 | 116.96 |
| 10 | 210.93 | 120.76 |
| 11 | 220.01 | 124.95 |
| 12 | 228.91 | 129.52 |
| 13 | 237.60 | 134.46 |
| 14 | 246.08 | 139.77 |
| 15 | 246.41 | 140.00 |

Circle Center At X = 116.7 ; Y = 337.0 and Radius, 235.9

*** 1.865 ***

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 123.63 | 101.21 |
| 2 | 133.57 | 102.33 |
| 3 | 143.47 | 103.75 |
| 4 | 153.32 | 105.46 |
| 5 | 163.12 | 107.46 |
| 6 | 172.85 | 109.75 |
| 7 | 182.51 | 112.33 |
| 8 | 192.09 | 115.20 |
| 9 | 201.58 | 118.35 |
| 10 | 210.98 | 121.79 |
| 11 | 220.26 | 125.50 |
| 12 | 229.43 | 129.48 |
| 13 | 238.48 | 133.74 |
| 14 | 247.40 | 138.27 |
| 15 | 250.58 | 140.00 |

Circle Center At X = 91.0 ; Y = 435.5 and Radius, 335.9

*** 1.867 ***

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 136.05 | 105.35 |
| 2 | 146.03 | 105.99 |
| 3 | 155.97 | 107.11 |
| 4 | 165.84 | 108.72 |
| 5 | 175.62 | 110.80 |
| 6 | 185.29 | 113.36 |
| 7 | 194.82 | 116.38 |
| 8 | 204.19 | 119.86 |
| 9 | 213.39 | 123.80 |
| 10 | 222.38 | 128.18 |
| 11 | 231.14 | 132.99 |
| 12 | 239.67 | 138.22 |
| 13 | 242.27 | 140.00 |

Circle Center At X = 127.9 ; Y = 310.7 and Radius, 205.5

*** 1.870 ***

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 136.05 | 105.35 |
| 2 | 145.79 | 107.63 |
| 3 | 155.50 | 110.03 |
| 4 | 165.18 | 112.54 |
| 5 | 174.83 | 115.17 |
| 6 | 184.44 | 117.91 |
| 7 | 194.03 | 120.76 |
| 8 | 203.58 | 123.72 |
| 9 | 213.09 | 126.80 |
| 10 | 222.57 | 129.99 |
| 11 | 232.01 | 133.29 |
| 12 | 241.41 | 136.69 |
| 13 | 250.20 | 140.00 |

Circle Center At X = -53.3 ; Y = 934.7 and Radius, 850.7

*** 1.873 ***

Failure Surface Specified By 10 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 160.90 | 115.45 |
| 2 | 170.85 | 116.45 |
| 3 | 180.73 | 117.97 |
| 4 | 190.51 | 120.03 |
| 5 | 200.18 | 122.60 |
| 6 | 209.69 | 125.69 |
| 7 | 219.02 | 129.29 |
| 8 | 228.15 | 133.37 |
| 9 | 237.04 | 137.94 |
| 10 | 240.58 | 140.00 |

Circle Center At X = 147.4 ; Y = 300.7 and Radius, 185.7

*** 1.878 ***

Y A X I S F T

.00 32.50 65.00 97.50 130.00 162.50

X .00 +-----+-----+-----+-----+

-

-

-

-

32.50 +

-

-

-

-

A 65.00 +

-

-

-

-

X 97.50 + * .

-

-

-

-

I 130.00 +2.

.....61

.....21

.....68.

.....61*

.....29.

S 162.50 +5190

.....82. *

.....6310

.....20

.....631

.....62*

195.00 +89

.....621

.....82

.....631*

.....21

.....639

F 227.50 +21

.....2.

.....61*

.....41

.....4

.....

T 260.00 + * ...*

**** PCSTABL5M ****

by
Purdue University

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

Run Date: 11/25/94
Time of Run: 16:45
Run By: DEW
Input Data Filename: RUN1TOP
Output Filename: RUN1TOP.OUT

PROBLEM DESCRIPTION:

ITEX Green River Landfill - Run1 (Static case with vehicle loading at top)

BOUNDARY COORDINATES

7 Top Boundaries
8 Total Boundaries

| Boundary No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Soil Type Below Bnd |
|--------------|-------------|-------------|--------------|--------------|---------------------|
| 1 | 100.00 | 100.00 | 120.00 | 100.00 | 2 |
| 2 | 120.00 | 100.00 | 150.00 | 110.00 | 1 |
| 3 | 150.00 | 110.00 | 170.00 | 120.00 | 1 |
| 4 | 170.00 | 120.00 | 190.00 | 120.00 | 1 |
| 5 | 190.00 | 120.00 | 210.00 | 130.00 | 1 |
| 6 | 210.00 | 130.00 | 240.00 | 140.00 | 1 |
| 7 | 240.00 | 140.00 | 260.00 | 140.00 | 1 |
| 8 | 120.00 | 100.00 | 260.00 | 100.00 | 2 |

ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

| Soil Type | Total Wt. | Saturated Wt. | Cohesion | Friction Angle | Pore Pressure | Piez. Constant | Surface No. |
|-----------|-----------|---------------|----------|----------------|---------------|----------------|-------------|
| No. | (pcf) | (pcf) | (psf) | (deg) | Param. | (psf) | |

| | | | | | | | |
|---|-------|-------|--------|------|-----|----|---|
| 1 | 120.0 | 145.0 | .0 | 30.0 | .00 | .0 | 1 |
| 2 | 130.0 | 155.0 | 5000.0 | 15.0 | .00 | .0 | 1 |

BOUNDARY LOAD(S)

1 Load(s) Specified

| Load No. | X-Left (ft) | X-Right (ft) | Intensity (lb/sqft) | Deflection (deg) |
|----------|-------------|--------------|---------------------|------------------|
| 1 | 245.00 | 255.00 | 5000.0 | .0 |

NOTE - Intensity Is Specified As A Uniformly Distributed Force Acting On A Horizontally Projected Surface.

1

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

300 Trial Surfaces Have Been Generated.

**15 Surfaces Initiate From Each Of 20 Points Equally Spaced Along The Ground Surface Between X = 110.00 ft.
and X = 164.00 ft.**

**Each Surface Terminates Between X = 240.00 ft.
and X = 260.00 ft.**

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 80.00 ft.

10.00 ft. Line Segments Define Each Trial Failure Surface.

1

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

*** * Safety Factors Are Calculated By The Modified Bishop Method * ***

Failure Surface Specified By 12 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|-----------|-------------|-------------|
| 1 | 161.16 | 115.58 |
| 2 | 171.07 | 114.29 |
| 3 | 181.06 | 113.84 |
| 4 | 191.06 | 114.24 |
| 5 | 200.98 | 115.48 |
| 6 | 210.76 | 117.56 |
| 7 | 220.33 | 120.46 |
| 8 | 229.62 | 124.16 |
| 9 | 238.57 | 128.63 |
| 10 | 247.10 | 133.84 |
| 11 | 255.16 | 139.76 |
| 12 | 255.44 | 140.00 |

Circle Center At X = 181.3 ; Y = 231.8 and Radius, 118.0

*** 1,482 ***

Individual data on the 17 slices

Failure Surface Specified By 12 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 158.32 | 114.16 |
| 2 | 168.27 | 113.22 |
| 3 | 178.27 | 113.05 |
| 4 | 188.25 | 113.64 |
| 5 | 198.16 | 115.00 |
| 6 | 207.93 | 117.11 |
| 7 | 217.52 | 119.96 |
| 8 | 226.86 | 123.55 |
| 9 | 235.89 | 127.83 |
| 10 | 244.57 | 132.80 |
| 11 | 252.84 | 138.42 |
| 12 | 254.83 | 140.00 |

Circle Center At X = 175.6 ; Y = 242.9 and Radius, 129.9

*** 1.485 ***

Failure Surface Specified By 12 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 161.16 | 115.58 |
| 2 | 170.90 | 113.31 |
| 3 | 180.82 | 112.10 |
| 4 | 190.82 | 111.97 |
| 5 | 200.78 | 112.92 |
| 6 | 210.57 | 114.93 |
| 7 | 220.10 | 117.99 |
| 8 | 229.23 | 122.06 |
| 9 | 237.88 | 127.08 |
| 10 | 245.93 | 133.01 |
| 11 | 253.30 | 139.77 |
| 12 | 253.50 | 140.00 |

Circle Center At X = 187.0 ; Y = 204.6 and Radius, 92.7

*** 1.514 ***

Failure Surface Specified By 11 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 161.16 | 115.58 |
| 2 | 170.86 | 113.15 |
| 3 | 180.77 | 111.84 |
| 4 | 190.77 | 111.64 |
| 5 | 200.73 | 112.57 |
| 6 | 210.52 | 114.61 |
| 7 | 220.01 | 117.74 |
| 8 | 229.10 | 121.91 |
| 9 | 237.66 | 127.08 |
| 10 | 245.58 | 133.18 |
| 11 | 252.63 | 140.00 |

Circle Center At X = 187.5 ; Y = 200.4 and Radius, 88.8

*** 1.541 ***

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 152.63 | 111.32 |
| 2 | 162.48 | 109.60 |
| 3 | 172.45 | 108.76 |
| 4 | 182.45 | 108.83 |
| 5 | 192.40 | 109.78 |
| 6 | 202.23 | 111.62 |
| 7 | 211.86 | 114.34 |
| 8 | 221.20 | 117.90 |
| 9 | 230.19 | 122.28 |
| 10 | 238.75 | 127.45 |
| 11 | 246.81 | 133.37 |
| 12 | 254.31 | 139.98 |
| 13 | 254.33 | 140.00 |

Circle Center At X = 176.8 ; Y = 220.4 and Radius, 111.7

*** 1.557 ***

Failure Surface Specified By 11 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 164.00 | 117.00 |
| 2 | 173.99 | 116.53 |
| 3 | 183.99 | 116.71 |
| 4 | 193.95 | 117.52 |
| 5 | 203.85 | 118.98 |
| 6 | 213.63 | 121.07 |
| 7 | 223.25 | 123.78 |
| 8 | 232.68 | 127.10 |
| 9 | 241.88 | 131.03 |
| 10 | 250.81 | 135.54 |
| 11 | 258.39 | 140.00 |

Circle Center At X = 176.3 ; Y = 272.0 and Radius, 155.5

*** 1.566 ***

Failure Surface Specified By 14 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 132.74 | 104.25 |
| 2 | 142.74 | 104.31 |
| 3 | 152.72 | 104.84 |
| 4 | 162.67 | 105.83 |
| 5 | 172.57 | 107.28 |
| 6 | 182.38 | 109.19 |
| 7 | 192.10 | 111.55 |
| 8 | 201.70 | 114.36 |
| 9 | 211.15 | 117.61 |
| 10 | 220.45 | 121.30 |
| 11 | 229.56 | 125.42 |
| 12 | 238.47 | 129.96 |
| 13 | 247.17 | 134.90 |
| 14 | 255.23 | 140.00 |

Circle Center At X = 136.4 ; Y = 319.4 and Radius, 215.2

*** 1.570 ***

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|----------------------|------------------------|------------------------|
| 1 | 129.90 | 103.30 |
| 2 | 139.87 | 102.61 |
| 3 | 149.87 | 102.50 |
| 4 | 159.86 | 102.97 |
| 5 | 169.80 | 104.03 |
| 6 | 179.67 | 105.66 |
| 7 | 189.42 | 107.86 |
| 8 | 199.03 | 110.63 |
| 9 | 208.47 | 113.95 |
| 10 | 217.69 | 117.81 |
| 11 | 226.67 | 122.21 |
| 12 | 235.39 | 127.11 |
| 13 | 243.80 | 132.52 |
| 14 | 251.88 | 138.41 |
| 15 | 253.81 | 140.00 |

Circle Center At X = 146.7 ; Y = 274.3 and Radius, 171.8

*** 1.589 ***

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|----------------------|------------------------|------------------------|
| 1 | 129.90 | 103.30 |
| 2 | 139.84 | 102.27 |
| 3 | 149.83 | 101.87 |
| 4 | 159.83 | 102.10 |
| 5 | 169.79 | 102.96 |
| 6 | 179.68 | 104.44 |
| 7 | 189.46 | 106.54 |
| 8 | 199.09 | 109.25 |
| 9 | 208.52 | 112.56 |
| 10 | 217.73 | 116.46 |
| 11 | 226.68 | 120.93 |
| 12 | 235.32 | 125.95 |
| 13 | 243.64 | 131.51 |
| 14 | 251.59 | 137.58 |
| 15 | 254.38 | 140.00 |

Circle Center At X = 151.2 ; Y = 260.8 and Radius, 159.0

*** 1.593 ***

Failure Surface Specified By 14 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|----------------------|------------------------|------------------------|
| 1 | 141.26 | 107.09 |
| 2 | 151.17 | 105.74 |
| 3 | 161.15 | 105.14 |
| 4 | 171.15 | 105.30 |
| 5 | 181.11 | 106.23 |
| 6 | 190.97 | 107.90 |
| 7 | 200.67 | 110.31 |
| 8 | 210.17 | 113.46 |
| 9 | 219.39 | 117.31 |
| 10 | 228.30 | 121.86 |
| 11 | 236.84 | 127.06 |
| 12 | 244.96 | 132.90 |
| 13 | 252.61 | 139.34 |
| 14 | 253.29 | 140.00 |

Circle Center At X = 164.0 ; Y = 236.8 and Radius, 131.7

*** 1.594 ***

| | Y | A | X | I | S | F | T |
|---|--------|---------|---------|-------------|---------|---------|---|
| | .00 | 32.50 | 65.00 | 97.50 | 130.00 | 162.50 | |
| X | .00 | +-----+ | +-----+ | +-----+ | +-----+ | +-----+ | |
| | - | - | - | - | - | - | |
| | 32.50 | + | | | | | |
| | - | - | - | - | - | - | |
| A | 65.00 | + | | | | | |
| | - | - | - | - | - | - | |
| X | 97.50 | + | | * | | | |
| | - | - | - | . | | | |
| | - | - | - | ..* | | | |
| I | 130.00 | + | |8 | | | |
| | - | | |7 | | | |
| | - | | |970 | | | |
| | - | | | | | | |
| | - | | |970* | | | |
| | - | | |2 | | | |
| S | 162.50 | + | |9875.1 | | | |
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| | - | | |05.16 | | | |
| | - | | |9831. | | | |
| | - | | |57.6 | | | |
| | - | | |831.* | | | |
| | 195.00 | + | |5.6. | | | |
| | - | | |521.. | | | |
| | - | | |826. | | | |
| | - | | |316..* | | | |
| | - | | |82... | | | |
| | - | | |316.. | | | |
| F | 227.50 | + | |917.. | | | |
| | - | | |6.. | | | |
| | - | | |21..* | | | |
| | - | | |62..1 | | | |
| | - | | |16. | | | |
| | - | | |11/ | | | |
| T | 260.00 | + | | * | * | * | |

**** PCSTABL5M ****

by
Purdue University

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

Run Date: 11/25/94
Time of Run: 16:45
Run By: DEW
Input Data Filename: RUN1
Output Filename: RUN1.OUT

PROBLEM DESCRIPTION:

ITEX Green River Landfill - Run1 (Static case with vehicle loading)

BOUNDARY COORDINATES

7 Top Boundaries
8 Total Boundaries

| Boundary No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Soil Type Below Bnd |
|--------------|-------------|-------------|--------------|--------------|---------------------|
| 1 | 100.00 | 100.00 | 120.00 | 100.00 | 2 |
| 2 | 120.00 | 100.00 | 150.00 | 110.00 | 1 |
| 3 | 150.00 | 110.00 | 170.00 | 120.00 | 1 |
| 4 | 170.00 | 120.00 | 190.00 | 120.00 | 1 |
| 5 | 190.00 | 120.00 | 210.00 | 130.00 | 1 |
| 6 | 210.00 | 130.00 | 240.00 | 140.00 | 1 |
| 7 | 240.00 | 140.00 | 260.00 | 140.00 | 1 |
| 8 | 120.00 | 100.00 | 260.00 | 100.00 | 2 |

ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

| Soil Total Saturated Cohesion Friction Pore Pressure Piez. | | Type Unit Wt. | Unit Wt. | Intercept Angle Pressure Constant Surface | No. | | |
|--|-------|---------------|----------|---|--------|-------|-----|
| No. | (pcf) | (pcf) | (psf) | (deg) | Param. | (psf) | No. |
| 1 | 120.0 | 145.0 | .0 | 30.0 | .00 | .0 | 1 |
| 2 | 130.0 | 155.0 | 5000.0 | 15.0 | .00 | .0 | 1 |

BOUNDARY LOAD(S)

1 Load(s) Specified

| Load No. | X-Left (ft) | X-Right (ft) | Intensity (lb/sqft) | Deflection (deg) |
|----------|-------------|--------------|---------------------|------------------|
|----------|-------------|--------------|---------------------|------------------|

| | | | | |
|---|--------|--------|--------|----|
| 1 | 180.00 | 190.00 | 2500.0 | .0 |
|---|--------|--------|--------|----|

NOTE - Intensity Is Specified As A Uniformly Distributed Force Acting On A Horizontally Projected Surface.

1

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

300 Trial Surfaces Have Been Generated.

**15 Surfaces Initiate From Each Of 20 Points Equally Spaced Along The Ground Surface Between $X = 110.00$ ft.
and $X = 164.00$ ft.**

**Each Surface Terminates Between $X = 240.00$ ft.
and $X = 260.00$ ft.**

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is $Y = 80.00$ ft.

10.00 ft. Line Segments Define Each Trial Failure Surface.

1

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

*** * Safety Factors Are Calculated By The Modified Bishop Method * ***

Failure Surface Specified By 12 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|-----------|-------------|-------------|
| 1 | 141.26 | 107.09 |
| 2 | 151.08 | 109.00 |
| 3 | 160.85 | 111.15 |
| 4 | 170.55 | 113.55 |
| 5 | 180.20 | 116.19 |
| 6 | 189.77 | 119.08 |
| 7 | 199.27 | 122.21 |
| 8 | 208.69 | 125.57 |
| 9 | 218.02 | 129.17 |
| 10 | 227.25 | 133.00 |
| 11 | 236.39 | 137.07 |
| 12 | 242.56 | 140.00 |

Circle Center At X = 70.7 ; Y = 496.5 and Radius, 395.7

*** 1.864 ***

Individual data on the 17 slices

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|----------------------|------------------------|------------------------|
| 1 | 121.37 | 100.46 |
| 2 | 131.35 | 101.14 |
| 3 | 141.29 | 102.21 |
| 4 | 151.19 | 103.64 |
| 5 | 161.02 | 105.45 |
| 6 | 170.78 | 107.62 |
| 7 | 180.45 | 110.16 |
| 8 | 190.02 | 113.06 |
| 9 | 199.48 | 116.32 |
| 10 | 208.80 | 119.93 |
| 11 | 217.99 | 123.89 |
| 12 | 227.02 | 128.19 |
| 13 | 235.88 | 132.82 |
| 14 | 244.56 | 137.79 |
| 15 | 248.10 | 140.00 |

Circle Center At X = 108.0 ; Y = 366.3 and Radius, 266.2

*** 1.872 ***

1

Failure Surface Specified By 12 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|----------------------|------------------------|------------------------|
| 1 | 141.26 | 107.09 |
| 2 | 151.19 | 108.29 |
| 3 | 161.06 | 109.87 |
| 4 | 170.87 | 111.84 |
| 5 | 180.59 | 114.20 |
| 6 | 190.21 | 116.93 |
| 7 | 199.71 | 120.03 |
| 8 | 209.09 | 123.51 |
| 9 | 218.33 | 127.34 |
| 10 | 227.40 | 131.54 |
| 11 | 236.31 | 136.08 |
| 12 | 243.29 | 140.00 |

Circle Center At X = 115.7 ; Y = 361.0 and Radius, 255.2

*** 1.914 ***

Failure Surface Specified By 14 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 129.90 | 103.30 |
| 2 | 139.83 | 104.42 |
| 3 | 149.73 | 105.85 |
| 4 | 159.58 | 107.59 |
| 5 | 169.37 | 109.64 |
| 6 | 179.08 | 111.99 |
| 7 | 188.73 | 114.64 |
| 8 | 198.28 | 117.60 |
| 9 | 207.74 | 120.85 |
| 10 | 217.09 | 124.39 |
| 11 | 226.32 | 128.23 |
| 12 | 235.43 | 132.36 |
| 13 | 244.41 | 136.76 |
| 14 | 250.51 | 140.00 |

Circle Center At X = 99.2 ; Y = 420.7 and Radius, 318.9

*** 1.918 ***

1

Failure Surface Specified By 14 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 132.74 | 104.25 |
| 2 | 142.72 | 104.75 |
| 3 | 152.68 | 105.72 |
| 4 | 162.58 | 107.14 |
| 5 | 172.40 | 109.01 |
| 6 | 182.13 | 111.34 |
| 7 | 191.73 | 114.11 |
| 8 | 201.21 | 117.31 |
| 9 | 210.52 | 120.95 |
| 10 | 219.66 | 125.01 |
| 11 | 228.60 | 129.49 |
| 12 | 237.33 | 134.37 |
| 13 | 245.82 | 139.65 |
| 14 | 246.32 | 140.00 |

Circle Center At X = 126.7 ; Y = 321.7 and Radius, 217.5

*** 1.920 ***

Failure Surface Specified By 12 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 141.26 | 107.09 |
| 2 | 151.22 | 107.97 |
| 3 | 161.13 | 109.31 |
| 4 | 170.97 | 111.10 |
| 5 | 180.72 | 113.33 |
| 6 | 190.36 | 116.00 |
| 7 | 199.86 | 119.11 |
| 8 | 209.22 | 122.64 |
| 9 | 218.40 | 126.60 |
| 10 | 227.39 | 130.97 |
| 11 | 236.18 | 135.75 |
| 12 | 243.23 | 140.00 |

Circle Center At X = 126.9 ; Y = 326.0 and Radius, 219.4

*** 1.933 ***

1

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 144.11 | 108.04 |
| 2 | 153.84 | 110.32 |
| 3 | 163.55 | 112.72 |
| 4 | 173.22 | 115.25 |
| 5 | 182.87 | 117.89 |
| 6 | 192.48 | 120.66 |
| 7 | 202.05 | 123.54 |
| 8 | 211.59 | 126.54 |
| 9 | 221.09 | 129.66 |
| 10 | 230.56 | 132.90 |
| 11 | 239.98 | 136.25 |
| 12 | 249.35 | 139.72 |
| 13 | 250.07 | 140.00 |

Circle Center At X = -35.0 ; Y = 893.4 and Radius, 805.6

*** 1.947 ***

Failure Surface Specified By 12 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 144.11 | 108.04 |
| 2 | 154.09 | 108.67 |
| 3 | 164.02 | 109.84 |
| 4 | 173.87 | 111.53 |
| 5 | 183.63 | 113.74 |
| 6 | 193.25 | 116.47 |
| 7 | 202.71 | 119.70 |
| 8 | 211.99 | 123.42 |
| 9 | 221.06 | 127.64 |
| 10 | 229.89 | 132.32 |
| 11 | 238.47 | 137.47 |
| 12 | 242.21 | 140.00 |

Circle Center At X = 137.2 ; Y = 295.8 and Radius, 187.9

*** 1.971 ***

1

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 127.05 | 102.35 |
| 2 | 137.05 | 102.36 |
| 3 | 147.04 | 102.84 |
| 4 | 157.00 | 103.79 |
| 5 | 166.90 | 105.21 |
| 6 | 176.72 | 107.09 |
| 7 | 186.44 | 109.43 |
| 8 | 196.04 | 112.23 |
| 9 | 205.50 | 115.47 |
| 10 | 214.79 | 119.16 |
| 11 | 223.91 | 123.28 |
| 12 | 232.81 | 127.82 |
| 13 | 241.50 | 132.78 |
| 14 | 249.94 | 138.14 |
| 15 | 252.58 | 140.00 |

Circle Center At X = 131.8 ; Y = 314.8 and Radius, 212.5

*** 1.980 ***

Failure Surface Specified By 16 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 121.37 | 100.46 |
| 2 | 131.26 | 101.92 |
| 3 | 141.12 | 103.58 |
| 4 | 150.95 | 105.43 |
| 5 | 160.74 | 107.47 |
| 6 | 170.49 | 109.71 |
| 7 | 180.19 | 112.13 |
| 8 | 189.84 | 114.74 |
| 9 | 199.44 | 117.53 |
| 10 | 208.99 | 120.52 |
| 11 | 218.47 | 123.69 |
| 12 | 227.89 | 127.04 |
| 13 | 237.25 | 130.58 |
| 14 | 246.53 | 134.29 |
| 15 | 255.74 | 138.19 |
| 16 | 259.79 | 140.00 |

Circle Center At X = 51.3 ; Y = 607.8 and Radius, 512.2

*** 1.987 ***

| | Y | A | X | I | S | F | T |
|----------|----------|-----------------|----------|----------|----------|----------|----------|
| | .00 | 32.50 | 65.00 | 97.50 | 130.00 | 162.50 | |
| X | .00 + | - + - + - + - + | | | | | |
| | | - | | | | | |
| | | 32.50 + | | | | | |
| | | - | | | | | |
| | | - | | | | | |
| | | - | | | | | |
| A | 65.00 + | | | | | | |
| | | - | | | | | |
| | | - | | | | | |
| | | - | | | | | |
| X | 97.50 + | * | | | | | |
| | | - | | | | | |
| | | - | | | | | |
| | | - | | | | | |
| I | 130.00 + |9 | | | | | |
| | | - | | | | | |
| | | - | | | | | |
| | | - | | | | | |
| S | 162.50 + |24 | | | | | |
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| | | - | | | | | |
| | |921 | | | | | |
| | | - | | | | | |
| | |0.2 | | | | | |
| | | - | | | | | |
| | |9 | | | | | |
| | | - | | | | | |
| | | * | | | | | |
| | | * | | | | | |

**** PCSTABL5M ****

by
Purdue University

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

Run Date: 11/25/94
Time of Run: 16:20
Run By: DEW
Input Data Filename: RUN1EQ
Output Filename: RUN1EQ.OUT

PROBLEM DESCRIPTION:
ITEX Green River Landfill - Run1 (Psuedo-static case)

BOUNDARY COORDINATES

7 Top Boundaries
8 Total Boundaries

| Boundary No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Soil Type Below Bnd |
|--------------|-------------|-------------|--------------|--------------|---------------------|
| 1 | 100.00 | 100.00 | 120.00 | 100.00 | 2 |
| 2 | 120.00 | 100.00 | 150.00 | 110.00 | 1 |
| 3 | 150.00 | 110.00 | 170.00 | 120.00 | 1 |
| 4 | 170.00 | 120.00 | 190.00 | 120.00 | 1 |
| 5 | 190.00 | 120.00 | 210.00 | 130.00 | 1 |
| 6 | 210.00 | 130.00 | 240.00 | 140.00 | 1 |
| 7 | 240.00 | 140.00 | 260.00 | 140.00 | 1 |
| 8 | 120.00 | 100.00 | 260.00 | 100.00 | 2 |

ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

| Soil Type | | Total Wt. | Saturated Wt. | Cohesion | Friction Angle | Pore Pressure | Piez. Constant | Surface No. |
|-----------|-------|-----------|---------------|----------|----------------|---------------|----------------|-------------|
| No. | (pcf) | (pcf) | (psf) | (deg) | Param. | (psf) | | |
| 1 | 120.0 | 145.0 | .0 | 30.0 | .00 | .0 | 1 | |
| 2 | 130.0 | 155.0 | 5000.0 | 15.0 | .00 | .0 | 1 | |

A Horizontal Earthquake Loading Coefficient
Of .100 Has Been Assigned

A Vertical Earthquake Loading Coefficient
Of .000 Has Been Assigned

Cavitation Pressure = .0 psf

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.

300 Trial Surfaces Have Been Generated.

15 Surfaces Initiate From Each Of 20 Points Equally Spaced
Along The Ground Surface Between $X = 105.00$ ft.
and $X = 164.00$ ft.

Each Surface Terminates Between $X = 240.00$ ft.
and $X = 260.00$ ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is $Y = 80.00$ ft.

10.00 ft. Line Segments Define Each Trial Failure Surface.

1

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 132.95 | 104.32 |
| 2 | 142.76 | 106.22 |
| 3 | 152.53 | 108.36 |
| 4 | 162.25 | 110.72 |
| 5 | 171.91 | 113.30 |
| 6 | 181.51 | 116.11 |
| 7 | 191.04 | 119.14 |
| 8 | 200.50 | 122.39 |
| 9 | 209.88 | 125.86 |
| 10 | 219.17 | 129.54 |
| 11 | 228.38 | 133.44 |
| 12 | 237.50 | 137.55 |
| 13 | 242.61 | 140.00 |

Circle Center At X = 55.5 ; Y = 529.0 and Radius, 431.7

*** 1.339 ***

Individual data on the 17 slices

| Slice No. | Width Ft(m) | Water Force | | Water Force | | Tie Force | | Tie Force | | Earthquake Force | | Surcharge Load | |
|--------------|----------------|-------------------|----------------|----------------|-----------------|----------------|----------------|----------------|-----------------|------------------|--|----------------|--|
| | | Weight Lbs(kg) | Top Lbs(kg) | Bot Lbs(kg) | Norm Lbs(kg) | Tan Lbs(kg) | Hor Lbs(kg) | Ver Lbs(kg) | Load Lbs(kg) | | | | |
| 1 | 9.8 | 803.4 | .0 | .0 | .0 | .0 | 80.3 | .0 | .0 | | | | |
| 2 | 7.2 | 1545.0 | .0 | .0 | .0 | .0 | 154.5 | .0 | .0 | | | | |
| 3 | 2.5 | 775.7 | .0 | .0 | .0 | .0 | 77.6 | .0 | .0 | | | | |
| 4 | 9.7 | 4847.3 | .0 | .0 | .0 | .0 | 484.7 | .0 | .0 | | | | |
| 5 | 7.7 | 5864.2 | .0 | .0 | .0 | .0 | 586.4 | .0 | .0 | | | | |
| 6 | 1.9 | 1594.1 | .0 | .0 | .0 | .0 | 159.4 | .0 | .0 | | | | |
| 7 | 9.6 | 6094.1 | .0 | .0 | .0 | .0 | 609.4 | .0 | .0 | | | | |
| 8 | 8.5 | 2585.7 | .0 | .0 | .0 | .0 | 258.6 | .0 | .0 | | | | |
| 9 | 1.0 | 159.9 | .0 | .0 | .0 | .0 | 16.0 | .0 | .0 | | | | |
| 10 | 9.5 | 2402.1 | .0 | .0 | .0 | .0 | 240.2 | .0 | .0 | | | | |
| 11 | 9.4 | 3902.5 | .0 | .0 | .0 | .0 | 390.3 | .0 | .0 | | | | |
| 12 | .1 | 61.0 | .0 | .0 | .0 | .0 | 6.1 | .0 | .0 | | | | |
| 13 | 9.2 | 4185.3 | .0 | .0 | .0 | .0 | 418.5 | .0 | .0 | | | | |
| 14 | 9.2 | 3425.2 | .0 | .0 | .0 | .0 | 342.5 | .0 | .0 | | | | |
| 15 | 9.1 | 2351.1 | .0 | .0 | .0 | .0 | 235.1 | .0 | .0 | | | | |
| 16 | 2.5 | 429.8 | .0 | .0 | .0 | .0 | 43.0 | .0 | .0 | | | | |
| 17 | 2.6 | 195.2 | .0 | .0 | .0 | .0 | 19.5 | .0 | .0 | | | | |

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 120.53 | 100.18 |
| 2 | 130.39 | 101.82 |
| 3 | 140.21 | 103.69 |
| 4 | 149.99 | 105.78 |
| 5 | 159.72 | 108.11 |
| 6 | 169.39 | 110.65 |
| 7 | 179.00 | 113.43 |
| 8 | 188.54 | 116.42 |
| 9 | 198.01 | 119.64 |
| 10 | 207.40 | 123.07 |
| 11 | 216.71 | 126.72 |
| 12 | 225.93 | 130.58 |
| 13 | 235.06 | 134.66 |
| 14 | 244.10 | 138.95 |
| 15 | 246.18 | 140.00 |

Circle Center At X = 54.7 ; Y = 526.2 and Radius, 431.1

*** 1.343 ***

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 132.95 | 104.32 |
| 2 | 142.88 | 105.52 |
| 3 | 152.75 | 107.07 |
| 4 | 162.57 | 108.98 |
| 5 | 172.31 | 111.24 |
| 6 | 181.96 | 113.85 |
| 7 | 191.52 | 116.81 |
| 8 | 200.96 | 120.10 |
| 9 | 210.28 | 123.74 |
| 10 | 219.46 | 127.70 |
| 11 | 228.49 | 132.00 |
| 12 | 237.36 | 136.61 |
| 13 | 243.34 | 140.00 |

Circle Center At X = 104.6 ; Y = 381.0 and Radius, 278.2

*** 1.359 ***

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 120.53 | 100.18 |
| 2 | 130.37 | 101.94 |
| 3 | 140.18 | 103.88 |
| 4 | 149.95 | 106.01 |
| 5 | 159.68 | 108.33 |
| 6 | 169.36 | 110.83 |
| 7 | 178.99 | 113.51 |
| 8 | 188.57 | 116.38 |
| 9 | 198.10 | 119.42 |
| 10 | 207.56 | 122.65 |
| 11 | 216.97 | 126.05 |
| 12 | 226.30 | 129.64 |
| 13 | 235.57 | 133.39 |
| 14 | 244.77 | 137.33 |
| 15 | 250.70 | 140.00 |

Circle Center At X = 32.5 ; Y = 620.8 and Radius, 528.0

*** 1.361 ***

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 132.95 | 104.32 |
| 2 | 142.91 | 105.20 |
| 3 | 152.82 | 106.50 |
| 4 | 162.68 | 108.21 |
| 5 | 172.45 | 110.34 |
| 6 | 182.12 | 112.87 |
| 7 | 191.68 | 115.80 |
| 8 | 201.11 | 119.13 |
| 9 | 210.39 | 122.85 |
| 10 | 219.51 | 126.96 |
| 11 | 228.45 | 131.44 |
| 12 | 237.19 | 136.29 |
| 13 | 243.26 | 140.00 |

Circle Center At X = 116.8 ; Y = 343.0 and Radius, 239.2

*** 1.369 ***

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 136.05 | 105.35 |
| 2 | 145.79 | 107.63 |
| 3 | 155.50 | 110.03 |
| 4 | 165.18 | 112.54 |
| 5 | 174.83 | 115.17 |
| 6 | 184.44 | 117.91 |
| 7 | 194.03 | 120.76 |
| 8 | 203.58 | 123.72 |
| 9 | 213.09 | 126.80 |
| 10 | 222.57 | 129.99 |
| 11 | 232.01 | 133.29 |
| 12 | 241.41 | 136.69 |
| 13 | 250.20 | 140.00 |

Circle Center At X = -53.3 ; Y = 934.7 and Radius, 850.7

*** 1.372 ***

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 123.63 | 101.21 |
| 2 | 133.57 | 102.33 |
| 3 | 143.47 | 103.75 |
| 4 | 153.32 | 105.46 |
| 5 | 163.12 | 107.46 |
| 6 | 172.85 | 109.75 |
| 7 | 182.51 | 112.33 |
| 8 | 192.09 | 115.20 |
| 9 | 201.58 | 118.35 |
| 10 | 210.98 | 121.79 |
| 11 | 220.26 | 125.50 |
| 12 | 229.43 | 129.48 |
| 13 | 238.48 | 133.74 |
| 14 | 247.40 | 138.27 |
| 15 | 250.58 | 140.00 |

Circle Center At X = 91.0 ; Y = 435.5 and Radius, 335.9

*** 1.375 ***

Failure Surface Specified By 15 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 123.63 | 101.21 |
| 2 | 133.62 | 101.72 |
| 3 | 143.58 | 102.65 |
| 4 | 153.48 | 104.00 |
| 5 | 163.33 | 105.77 |
| 6 | 173.08 | 107.95 |
| 7 | 182.74 | 110.55 |
| 8 | 192.28 | 113.55 |
| 9 | 201.68 | 116.96 |
| 10 | 210.93 | 120.76 |
| 11 | 220.01 | 124.95 |
| 12 | 228.91 | 129.52 |
| 13 | 237.60 | 134.46 |
| 14 | 246.08 | 139.77 |
| 15 | 246.41 | 140.00 |

Circle Center At X = 116.7 ; Y = 337.0 and Radius, 235.9

*** 1.380 ***

Failure Surface Specified By 13 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 136.05 | 105.35 |
| 2 | 146.03 | 105.99 |
| 3 | 155.97 | 107.11 |
| 4 | 165.84 | 108.72 |
| 5 | 175.62 | 110.80 |
| 6 | 185.29 | 113.36 |
| 7 | 194.82 | 116.38 |
| 8 | 204.19 | 119.86 |
| 9 | 213.39 | 123.80 |
| 10 | 222.38 | 128.18 |
| 11 | 231.14 | 132.99 |
| 12 | 239.67 | 138.22 |
| 13 | 242.27 | 140.00 |

Circle Center At X = 127.9 ; Y = 310.7 and Radius, 205.5

*** 1.382 ***

Failure Surface Specified By 10 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|--------------|----------------|----------------|
| 1 | 160.90 | 115.45 |
| 2 | 170.85 | 116.45 |
| 3 | 180.73 | 117.97 |
| 4 | 190.51 | 120.03 |
| 5 | 200.18 | 122.60 |
| 6 | 209.69 | 125.69 |
| 7 | 219.02 | 129.29 |
| 8 | 228.15 | 133.37 |
| 9 | 237.04 | 137.94 |
| 10 | 240.58 | 140.00 |

Circle Center At X = 147.4 ; Y = 300.7 and Radius, 185.7

***** 1.383 *****

Y A X I S F T

.00 32.50 65.00 97.50 130.00 162.50

X .00 +-----+-----+-----+-----+

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-831

-72*

195.00 +96

-721

-92

-731*

-21

-836

F 227.50 +21

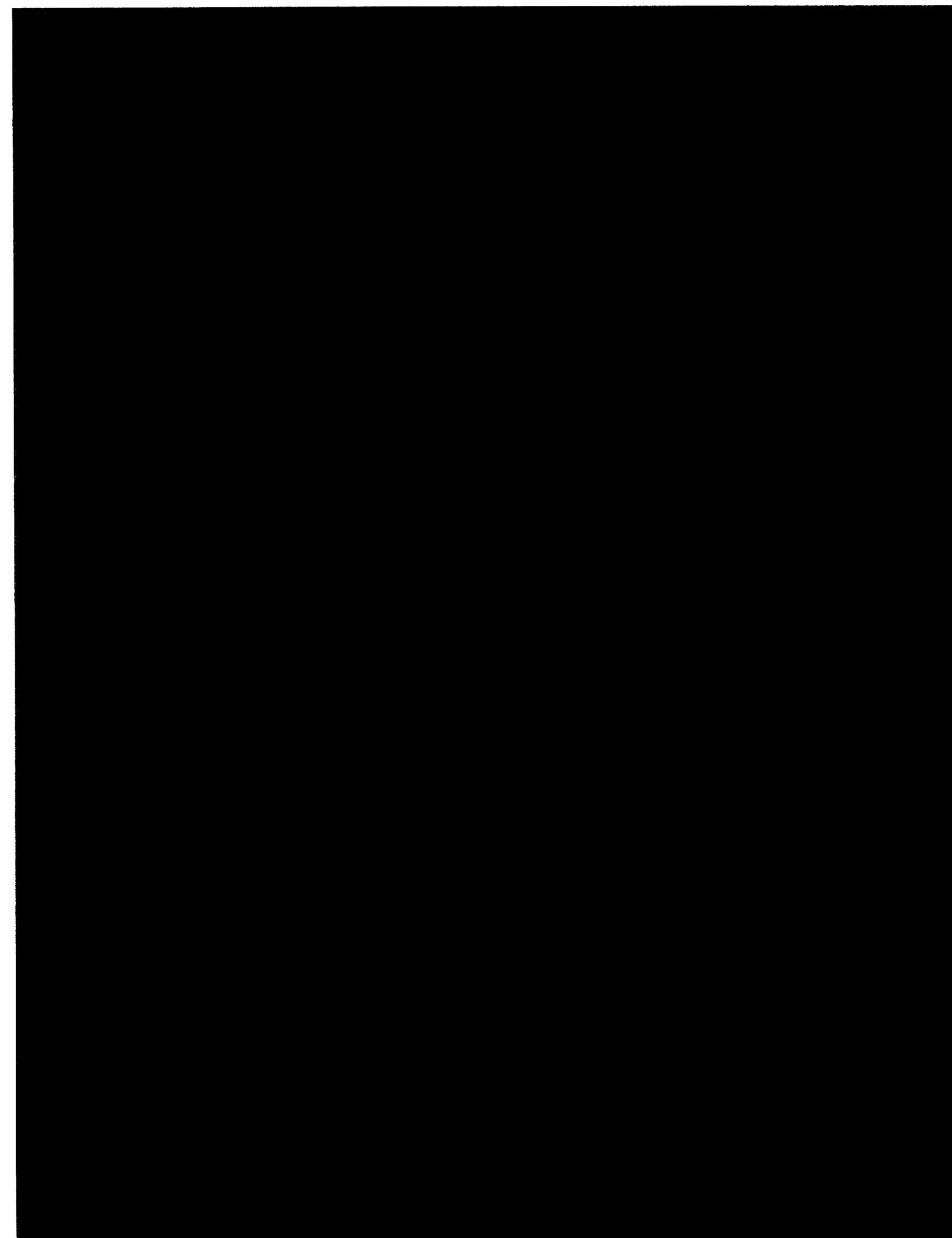
-2.

-71*

-41

-4

T 260.00 + * ...*





State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

Michael O. Leavitt
Governor

Kathleen Clark
Executive Director

John Kimball
Division Director

1594 West North Temple, Suite 2110
PO Box 146301
Salt Lake City, Utah 84114-6301
801-538-4700
801-538-4709 (Fax)
801-538-7458 (TTY)

January 10, 2002

Gretchen A. Semerad
ATC Associates, Inc.
2681 Parleys Way, Suite 106
Salt Lake City, UT 84109

Dear Ms. Semerad,

I am writing in response to your request dated December 27, 2001 for information regarding species of special concern proximal to the proposed Solitude Landfill project in Green River, Utah.

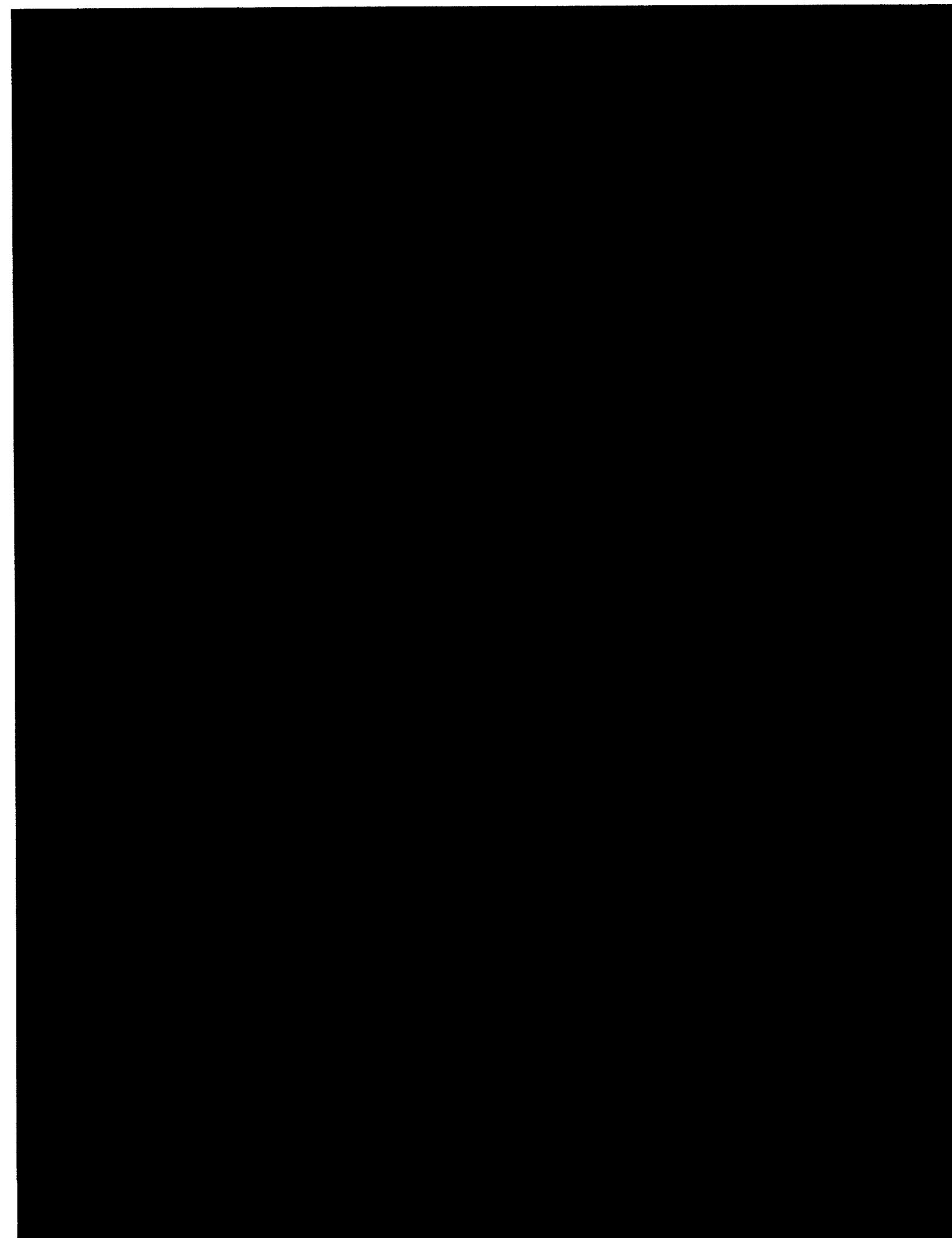
The Utah Division of Wildlife Resources (UDWR) does not have records of occurrence for any threatened, endangered, or sensitive species in the area of the proposed landfill site.

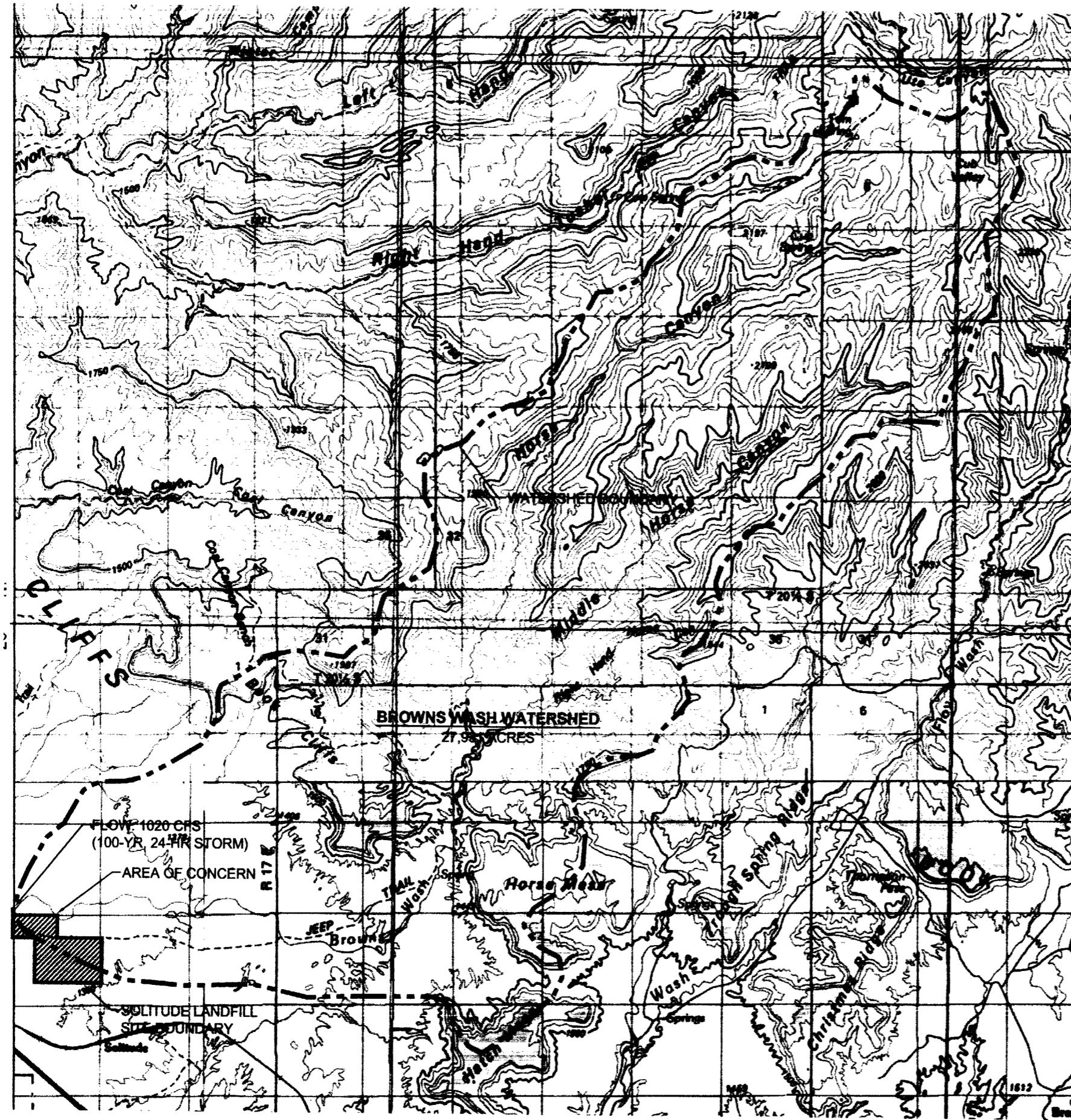
The information provided in this letter is based on data existing in the Utah Division of Wildlife Resources' central database at the time of the request. It should not be regarded as a final statement on the occurrence of any species on or near the designated site, nor should it be considered a substitute for on-the-ground biological surveys. Moreover, because the Utah Division of Wildlife Resources' central database is continually updated, and because data requests are evaluated for the specific type of proposed action, any given response is only appropriate for its respective request.

In addition to the information you requested, other significant wildlife values might also be present on the designated site. Please contact UDWR's regional habitat manager, Derris Jones, at (435) 636-0267, if you have any questions.

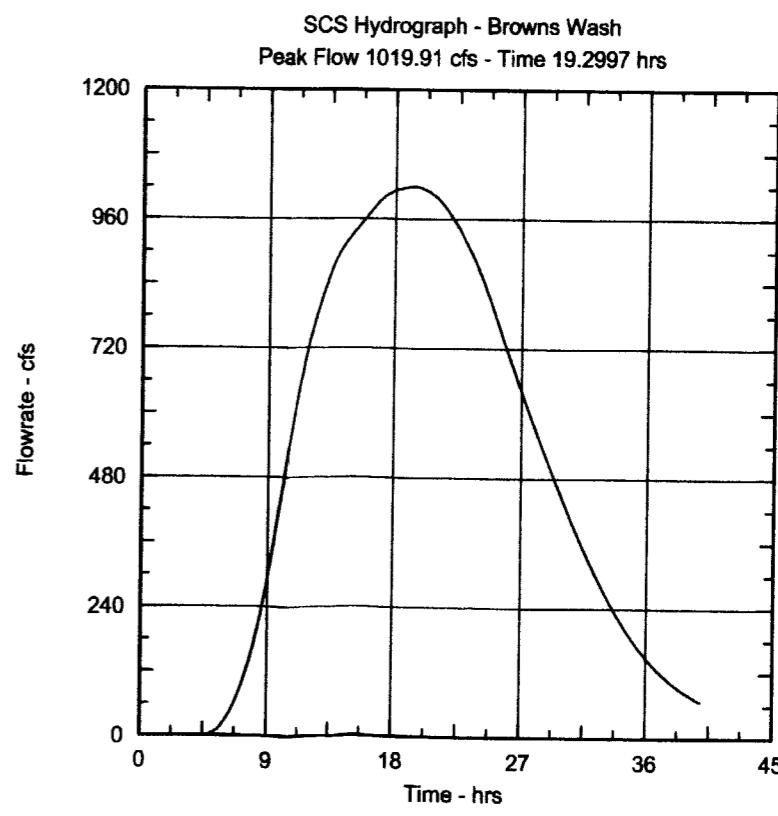
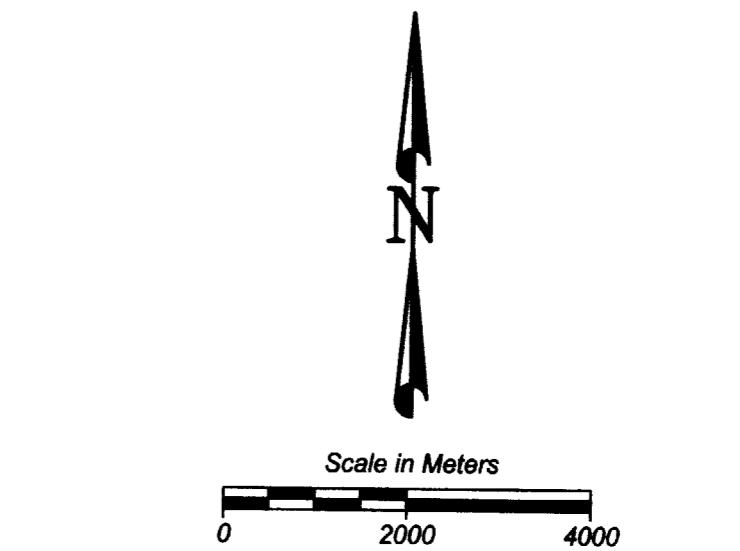
The UNHP normally charges for this type of request, but due to the small amount of research and time required to fulfill this request, you will not be charged for this information. Please contact our office at (801) 538-4759 if you require further assistance.

Sincerely,
Anne Axel
Information Manager





SOLITUDE LANDFILL BROWNS WASH SURFACE HYDROLOGY



SOLITUDE LANDFILL

Browns Wash Surface Water Hydrology

TR-20 SCS Method

Given Input Data:

Description Browns Wash
Drainage area 27930.74 ac
Runoff curve number, CN 65
Time of concentration, Tc 12.1455 hrs
Dimensionless Hydrograph scsdim
Rainfall 2.63 in
Distribution Curve tr20t2: Type 2, 24 hrs
Duration 24.0000 hrs
Antecedent Moisture Condition ... Type II
Time Increment, Tp 0.1000 hrs

Computed Results:

Peak discharge, qp 1019.91 cfs
Peak Time, Tp 19.30 hrs
Peak rate factor 484
Constant, K 0.7500
Runoff Volume 0.68 in
..... 19273.54 cfs-hrs
..... 1592.77 acft

Hydraulics - Culvert Calculator

Given Input Data:

| | |
|--------------------------|----------------------|
| Channel Type..... | Trapezoidal |
| Flow Rate..... | 1020 cfs |
| Slope..... | 0.0035 ft/ft |
| Manning's Roughness..... | 0.02 (Earth Channel) |
| Side Slope..... | 3H:1V |
| Base Width..... | 25 ft |

Computed Results:

| | |
|-----------------------|------------|
| Velocity..... | 8.3305 fps |
| Area..... | 258.11 sf |
| Perimeter..... | 62.98 ft |
| Wetted Area..... | 122.32 sf |
| Wetted Perimeter..... | 46.88 ft |
| Hydraulic Radius..... | 2.61 ft |
| Top Width..... | 45.76 ft |
| Percent Full..... | 57.62 ft |
| Depth of Flow..... | 3.46 ft |

Hydrograph Output

```
#Units=Time,hrs,Flowrate,cfs
#SCS Hydrograph Data
#Time - hrs  Flowrate - cfs
#-----
4.70000000,0.01266994
4.80000000,0.69966364
4.90000000,1.65648218
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